

## ULTRA LOW CAPACITANCE STEERING DIODE/TVS ARRAY

### DESCRIPTION

The PRUSB05UBK is an ultra low capacitance steering diode/TVS array with integrated resistors at each data line for a dual USB 2.0 port and power bus protection. The device protects against positive ESD and fast surge voltage transients and high negative voltage transients at the data lines such as USB Killer devices plugged into USB ports.

This device is offered in a 14 lead DFN package configuration is rated at 500 Watts peak pulse power (8/20 $\mu$ s) per line. The PRUSB05UBK meets and exceeds the ESD requirements of IEC 61000-4-2 and the EFT requirements of IEC 61000-4-4.

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air  $\pm$ 15kV, Contact  $\pm$ 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 24A, 8/20 $\mu$ s - Level 2(Line-Gnd) & Level 3(Line-Line)
- 500 Watts Peak Pulse Power per Line(tp = 8/20 $\mu$ s)
- ESD Protection > 25 kilovolts
- Low Clamping Voltage
- Protection for 4 Lines
- Ultra Low Capacitance  $C_{j(SD)}$ : 2.5pF Typical
- RoHS Compliant
- REACH Compliant

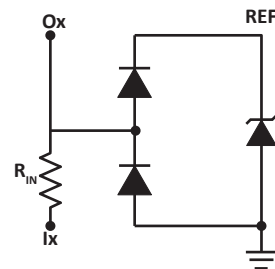
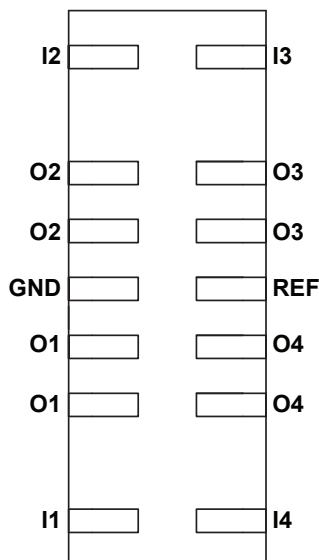
### APPLICATIONS

- Gigabit Ethernet
- Portable Electronics
- Video Card Interfaces
- USB 1.0, USB 2.0
- DVI Interfaces

### MECHANICAL CHARACTERISTICS

- Molded DFN-14 Package
- Approximate Weight: 16 milligrams
- Lead-Free Pure-Tin Plating
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- Flammability Rating UL 94V-0
- 16mm Tape and Reel per EIA Standard 481

### PIN CONFIGURATION & CIRCUIT DIAGRAM



**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20μs) at Outputs	P <sub>PP</sub>	500	Watts
Operating Temperature	T <sub>L</sub>	-55 to 150	°C
Storage Temperature	T <sub>STG</sub>	-55 to 150	°C
Forward Surge Rating (5ms @ 25°C, I <sub>F</sub> = 50mA)	V <sub>F</sub>	0.5 Min. - 1.2 Max.	Volts

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE (Note 1)  V <sub>WM</sub> VOLTS	MINIMUM BREAKDOWN VOLTAGE (Note 1)  @ 1mA V <sub>(BR)</sub> VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1) @ I <sub>p</sub> = 1A V <sub>C</sub> VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1) @ I <sub>p</sub> = 5A V <sub>C</sub> VOLTS	MAXIMUM LEAKAGE CURRENT (Note 1)  @ V <sub>WM</sub> I <sub>D</sub> μA
PRUSB05UBK	05UBK	5.0	6.0	12.0	15.0	5

**NOTES**

1. Measured from output to ground.

TYPICAL CAPACITANCE I/O to GND  @0V, 1MHz C <sub>J(SD)</sub> pF	TYPICAL CAPACITANCE I/O to I/O  @0V, 1MHz C <sub>J(SD)</sub> pF	MAXIMUM CAPACITANCE I/O to GND  @0V, 1MHz C <sub>J(SD)</sub> pF	MAXIMUM CAPACITANCE I/O to I/O  @0V, 1MHz C <sub>J(SD)</sub> pF	MAXIMUM RESISTANCE  ±10% R <sub>IN</sub> OHMS
3.5	2.5	5.0	4.0	10

## TYPICAL DEVICE CHARACTERISTICS

FIGURE 1  
PULSE WAVE FORM

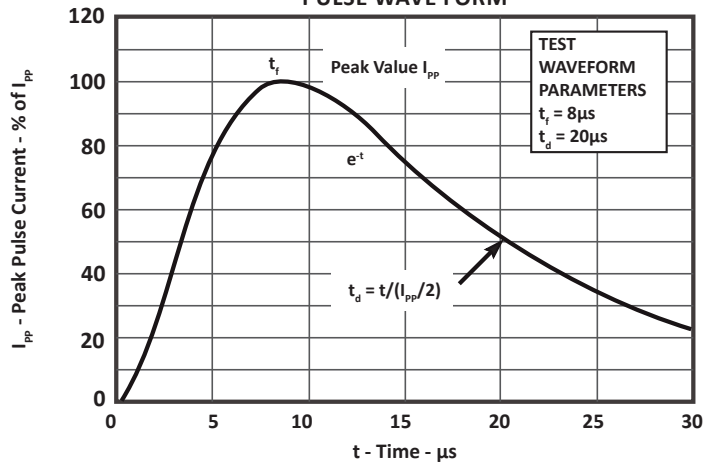
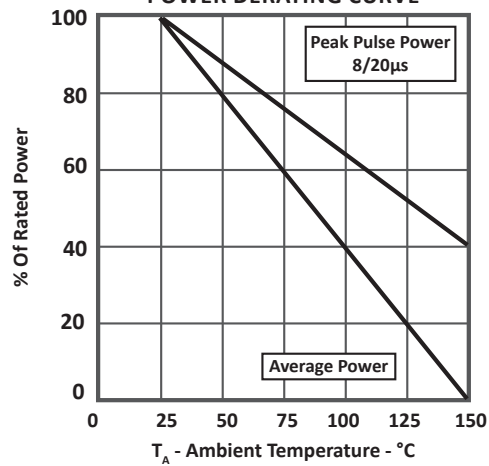


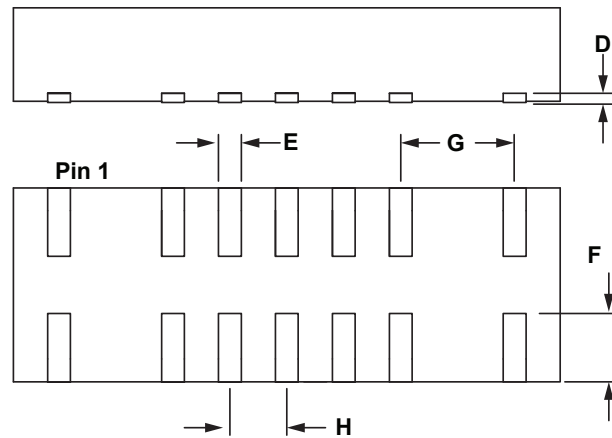
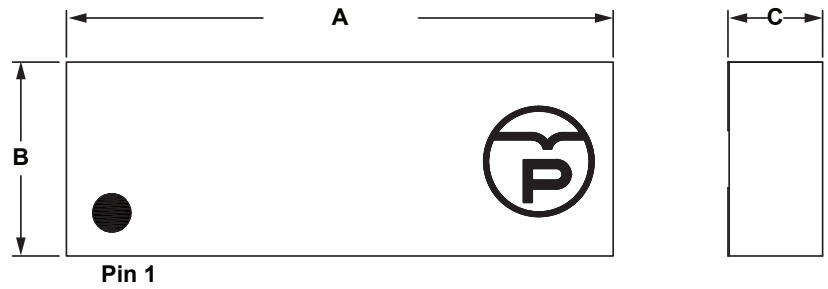
FIGURE 2  
POWER DERATING CURVE



## PACKAGE INFORMATION

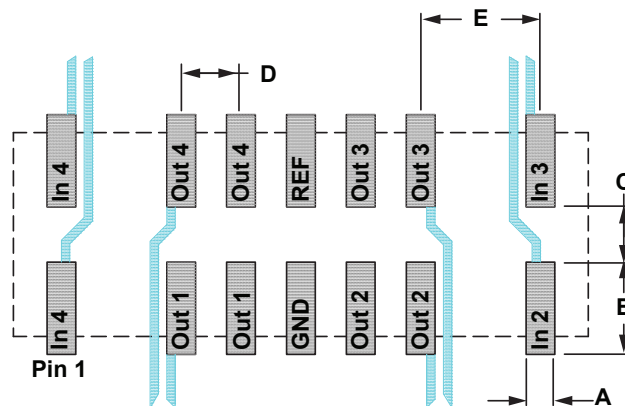
## OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.14	12.24	0.477	0.483
B	4.27	4.37	0.167	0.173
C	2.06	2.16	0.080	0.089
D	0.18	0.22	0.007	0.009
E	0.46	0.56	0.018	0.022
F	1.48	1.57	0.058	0.062
G	2.54		0.100	
H	1.27		0.050	

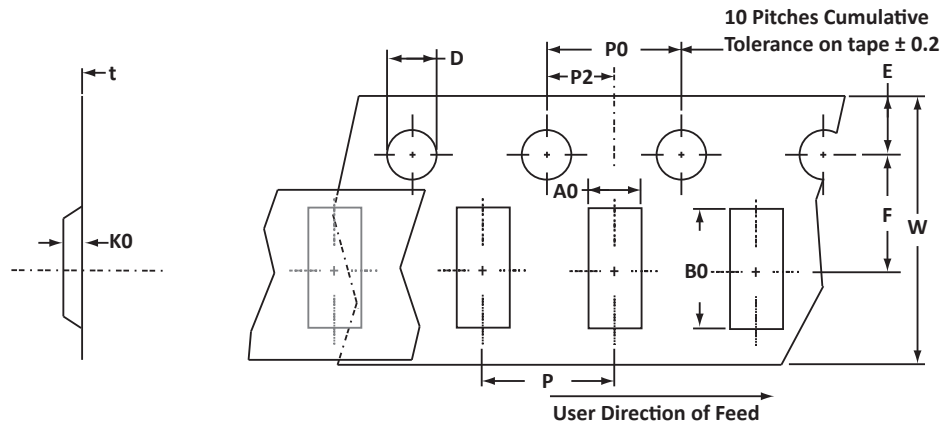


## PAD LAYOUT DIMENSIONS

DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.61	0.024
B	1.96	0.077
C	1.17	0.046
D	1.27	0.050
E	2.54	0.100



## TAPE AND REEL



## SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	16mm	4.45 ± 0.10	12.35 ± 0.10	2.26 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	0.25

## NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 1,000 pieces per 16mm tape.
- Marking on Part - marking code (see page 2) and pin one defined by dot on package.

## ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PRUSB05UBK	n/a	-T7	1,000	7"	n/a

This device is only available in a Lead-Free configuration.

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products.

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